PNEUMATIC FORCEPS.

THE

PNEUMATIC FORCEPS.

OPERATES IN CHILD-BIRTH DELIVERY BY VAGINAL DILATION, SUCTION AND GRASP. WARRANTED TO HOLD MORE THAN FIFTY LBS. TO THE VERTEX WITH EVERY INSTRUMENT. MANUFACTURED (BY EXCLUSIVE RIGHT) AND SOLD BY THE

PNEUMATIC FORCEPS CO.

HEADQUARTERS, USQUEPAUG, R. I.

H. L. STILLMAN, M. D., Inventor.

A. CRAWFORD GREENE, PRINTER, PROVIDENCE.

Fig. 1

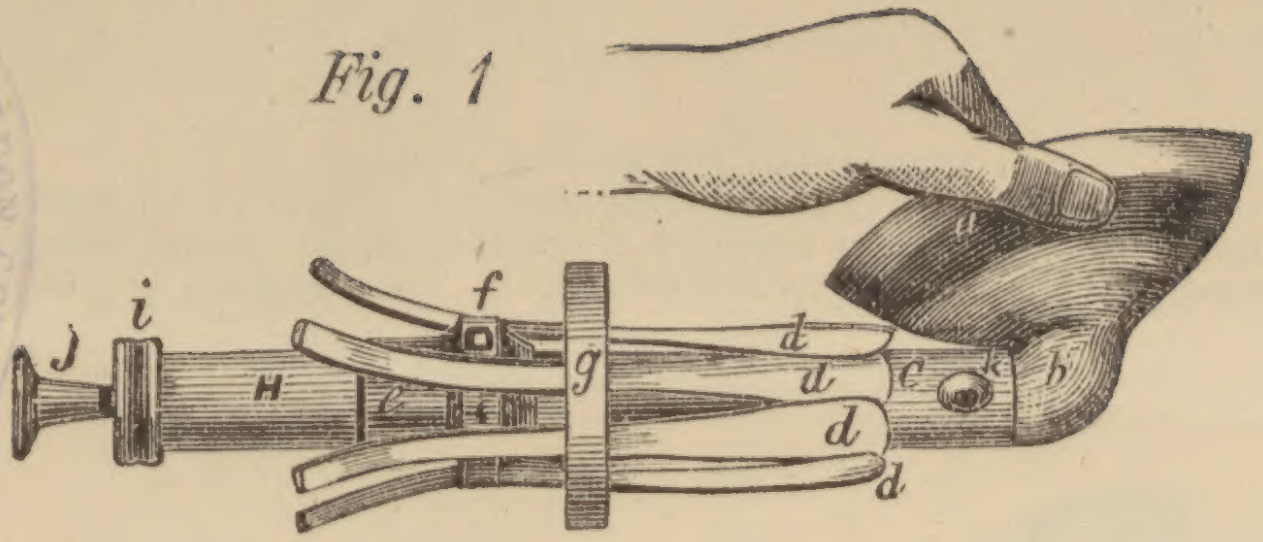

Fig. 1 represents the position of the Cup for introduction.

a Cup. *b* Flexible Neck. *c* Connecting Cylinder. *d d d d* Dilators.
e Dilator Collar. *f* Set Screw. *g* Dilating Band. *h* Pump Barrel.
i Handle for Trection. *j* Pump Handle. *k* Anti-congestion Valve.

Fig. 2

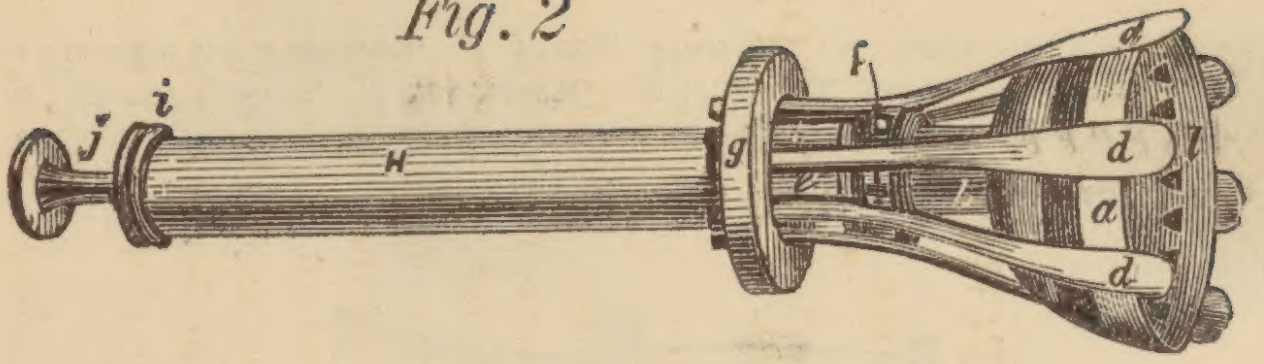

Fig. 2. Position after being introduced.

a Cup. *b* Flexible Neck. *c* Connecting Cylinder. *d d d* Dilators.
e Dilator Collar. *f* Set Screw. *g* Dilating Band. *h* Pump Barrel.
i Handle for Trection. *j* Pump Handle. *k* Anti-congestion Valve.
l Circle of Notches and Depressions.

HISTORY

OF THE

PNEUMATIC FORCEPS.

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More than twenty years ago, Prof. James Y. Simpson, of the Edinburgh College, conceived the idea of child-birth delivery by means of suction, or atmospheric pressure to the vertex of the child.

Nearly every one has seen those circular pieces of leather, with cords attached to the center, by which boys pick up bricks, stones and other plain surfaced objects, by first pressing the leather, when wet, upon the object, so as to exclude all air, and raising by the string.

Now Prof. Simpson proposed to use a concave, circular piece of leather, fitting to the convexity of the vertex of the child, and the air therein to be exhausted by means of the ordinary air pump, attached

to the center of the leather, the pump also acting as a handle for traction.

Since that time the cups have been constructed of India rubber, with a tubed stem several inches in length, communicating with the pump, and are at the present time used to some extent in Europe These instruments are, in a great measure, inoperative, and fail to meet their requirements, as will be hereafter shown.

In the year 1873, Dr. H. L. Stillman, a regular practitioner of Usquepaug, R. I., probably from the same observations of the Edinburgh professor, conceived the idea of an instrument similar to the one mentioned. He, at that time, had never heard of Simpson's plan.

After giving it due consideration, he concluded that it would not be sufficiently operative, from the fact that suction, from its general application, means nothing more than atmospheric pressure, and recollecting that only a small portion of the center of the vertex receives a fair share of this pressure, when in the uterus or vagina, all of the rest of the child is subject to the natural suction and pressure of the soft parts of the mother, and partial atmospheric exclusion. Subsequent experiments and observation have proved this theory to be correct.

Dr. Stillman then set himself to work to overcome this difficulty, and succeeded in a plan of dilation of

the vagina, letting air in on the full surface of the cup, when engaged with the vertex, also thereby rendering an easier passage for the head.

The dilators are so constructed (as seen in the engraving) as to present the appearance of a cone, the base on the vertex, with the apex pointing outwardly when expanded, acting in a similar manner upon the vagina as the pointed sac of liquor amnii, to dilate the os uteri, previous to its rupture, and the expulsion of the head. The dilators also hold the cup in a central position upon the vertex. They are made to expand and contract at the will of the operator. (See engraving.)

In addition to this the Doctor has made other marked improvements in the original instrument, that will be shown hereafter.

THE ELASTIC CUP.

The elastic cup, as shown by the engraving, is composed of soft and moderately hardened India rubber, moulded together. The tube neck is composed of the soft, the outer end of the pump filling about one-half of it. It will be seen that it admits of flexion only close to the body of the cup, in less than one-half inch space. The advantage in a short neck is this: the cup admitting of flexion on the pump, accommodates itself to the curvature of the vaginal pas-

sage, and the leverage requisite to convey the head around this curve, is here obtained, where space would not admit of the working of a long neck.

The space from the neck of the cup to one-half inch of the edge is composed of the moderately hardened India rubber, sufficiently hard to prevent collapse of the cup on the vertex, when the air is exhausted. It is found thereby to retain a much better hold. The edge, like the neck, is composed of the soft, which stretches firmly upon the vertex, and answers as packing, preventing the admission of air or liquids from its exterior; also prevents pain or injury in its introduction to the soft parts of the mother.

Just back of the inner margin of the soft edge is a circle of notches, pointing inwardly, with depressions behind. (See engraving.) These, when stretched upon the vertex by suction of air, leaves congestion of the scalp sufficient to fill these depressions; the notches hold by grasp to the scalp, exterior to the vacuum, ten or twelve pounds, independently of atmospheric pressure. They also prevent any rotatory or sliding movement upon the vertex.

The change in the neck, the combination in the cup of soft and moderately hardened India rubber, and the circle of notches and depressions, are Stillman's improvements in the cup. The cavity of the cup measures in breadth, at the edges, 3 1-10 inches, by 1 1-2 inches deep.

When introduced, the dilators should be drawn backwardly and collapsed, the cup flexed so as to bring the edges on a line with the pump: the two edges flattened together by grasp of the thumb and fore finger. The cup being well lubricated upon its exterior surface, with its edges turned upwardly, is easily introduced so that the outer extremity passes readily on the posterior wall of the vagina to the vertex. The thumb and forefinger is then drawn towards the inner extremity of the cup, allowing the outer to flatten upon the posterior wall of the vagina, until the inner extremity passes behind the pubic arch, and the cup becomes engaged with the vertex.

This is very easily accomplished. A stroke or two of the pump will be necessary to hold it in position, until the dilators are introduced.

In case the head has not yet passed through the os uteri, if open two inches in diameter, the same rule should be observed in its introduction, only that the outer extremity comes in contact with the vertex and is allowed to glide backwardly, between the os and vertex. The index finger being then introduced anteriorly, (and, if necessary, posteriorly) to adjust the edges of the womb over the cup. This requires more tact, but can be accomplished without difficulty. A strip of thin membrane, if accidentally caught under the edge of the cup, does not prevent a fair working and hold.

THE DILATORS.

The dilators, six in number, are attached to a sliding collar on the barrel of the pump. They are composed of the best of spring steel, nickeled, rounded and smooth, so as not to do injury in case of the slipping of the cup. The outer extremities should lap over each other when collapsed. A ring of India rubber over the collar and around the dilators, when pressed outwardly, collapses the dilators, when drawn inwardly, expands them.

A set screw holds the sliding collar (as shown in the engraving) at any place on the barrel, at the will of the operator. The dilators, to be introduced, should be drawn backward, toward the handle of the pump, collapsed until after the introduction of the cup, the set screw loosened, the rubber band then drawn backward a little, so as to tend to expand the dilators, but which should be held compressed by the hand, and slid down the barrel, introduced in this manner, until the dilators come in contact with the shoulder of the cup. They then should be allowed to expand, so as to clear the shoulder of the cup as they are pressed inwardly, as far as its edge. They are then to be expanded as much more as practicable, the set screw made fast, and the air exhausted from the cup, and traction commenced.

A moderate working of the pump, kept up while traction is being made, secures a firm hold. In case

of a superfluous growth of hair, a brisk action of the pump may be required; a firm hold will thereby be secured. The atmospheric pressure collapses the abdomen from above in proportion as the head recedes downward.

THE AIR PUMP.

This does not essentially differ from air pumps in general (being made of brass and other hard metal, rendered non-corrosive by nickel), with the exception of the valves. Instead of the ordinary oiled silk valves, which are soon injured by moisture, and easily clogged up, we employ an indestructible light metal valve, (Stillman's invention), held to its seat by a small spiral spring. The valve and seat ground together, so as to secure a perfect contact.

To keep them in order, all that will be necessary is to wipe occasionally the valves and their seats, in case foreign substances prevent their working perfectly. The spiral spring should be made to press upon the valve about sufficient to hold its weight.

In case of a thick and tenacious secretion, which sometimes exists in the vagina, at child-birth delivery, and would be likely to obstruct the working of the pump, it should be wiped out with a soft sponge, before the introduction of the cup.

INDICATION FOR THE USE OF THE PNEUMATIC FORCEPS.

From the harmlessness of its action, its use is much more frequently indicated than the ordinary forceps.

It may be used in all cases of tedious labor, in the second stage, and many in the first, where the os uteri is sufficiently dilated, whether from obstruction or exhaustion. In vertex presentations others of the head are very rare. Statistics show only one other to about every two hundred and fifty vertex presentations, making their chances such that an ordinary practitioner would hardly expect to meet with one oftener than once in seven or eight years.

Its use, as a rule, is indicated in about one case in ten, we think. While the ordinary forceps, from the severity and danger of their use, hospital statistics give them a place only to one in every two hundred cases.

NOTE.—In a case where the head of the child is high up, the hips should be elevated, the handle of the pump carried as low down as possible. Let the dilators on the anterior side touch the margin of the cup, and if leverage is necessary, the cup being somewhat flexed on the pump, the dilators must be allowed to fall short an inch, or more if necessary, on the posterior side.

ITS ADVANTAGES OVER THE ORDINARY FORCEPS.

Its advantages over the ordinary forceps are these:

1. It is much quicker and easier introduced.

2. It does not cause pain or suffering to the mother, and is devoid of the danger of the ordinary forceps.

3. It has thus far proved to be devoid of danger to the child.

4. It does not increase the transverse diameter of the head, as the forceps do.

5. From its easy introduction, without pain, its use is much oftener indicated than the ordinary forceps. Any intelligent practitioner may use it.

6. Not increasing the diameter of the head (and for reasons hereafter shown), it thereby facilitates a much easier delivery.

The cup is capable of holding to the vertex, by suction alone, from fifty to ninety pounds, although usually requiring much less than this.

It has been said that the ordinary forceps are capable of diminishing the transverse diameter of the head as much or more than the thickness of the blades. This we admit, as the head is more or less elastic, but the anterior posterior diameter is thereby necessarily increased. As shown from the following fact, the central point of traction must be near the end

of the blades of the forceps, while the soft parts obstruct the head anteriorly and posteriorly below it. This tends to diminish the occipito mental diameters, thereby much increasing the anterio posterior diameter, so that really there is little or nothing gained by compression. While traction from our instrument, after removing vaginal obstruction and producing a vacuum at the vertex, sensibly elongates the head, and thereby diminishes all of the other diameters, and this may account for the limited amount of power many times required in its use.

THE EFFECT ON THE HEAD.

While no plausible objection has yet been offered in its use on the mother, two have been offered in its use upon the child, viz: separation of the scalp, and congestion of the brain. It has been claimed that the force of suction is spent on the scalp, and that violent traction would be sufficient to separate the scalp from the cranial bones, by rupturing the connecting tissues. From the first we concluded that, as air is excluded between the scalp and skull, and the same amount of suction here exists after the application of the cup, as between the cup and scalp, and as the connecting tissue is strong, not the slightest danger exists. Here is an experiment which any one having an instrument may try.

Take a circular piece of leather, four or five inches in diameter, saturate it thoroughly with hot water or mucilage, (which is better), press it firmly upon a plain surface, so as to exclude all air, apply the cup centrally over it, and exhaust the air by the pump, and make traction. If properly applied, it will be found to hold fifteen or twenty pounds to a plain surface, and when the suction breaks, it will be found to be between the cup and the leather, the latter still clinging to its surface. This ought to be sufficient proof of the correctness of our theory.

Congestion of the brain has been mentioned. Congestion of the scalp is always present from its use, but its duration is usually short. But it is to be remembered that the posterior fontanelle (the only one that is covered by the cup) is nearly always closed at the time of birth, rendering a wall of protection to the brain. Of the several cases that have come under our observation, not one has received the slightest harm. The force of traction upon the instrument is nearly as follows:

Upon the dilators, when well expanded, about 1-3, by suction 1-2, by the notches and depressions 1-6. nearly. This may be given as a rule, but cannot in every case be adhered to, as a superfluous growth of hair moderates the hold of the notches, and there are some women that a full expansion of the dilators causes considerable annoyance. Hence, in these cases, a moderate dilation.

Doctor,—

We have given you a description of our instrument, together with an explanation of its use. We hope that you have been favorably impressed with it; we believe that you have. The instrument has merit, and it must stand upon it, and it is due it here to state that it has been favorably received by every eminent physician to whose notice it has been brought.

It now remains for you to say whether you will have an instrument or not, and if so, when? Do not wait, thinking thereby to better yourself. The price of it is $20.00. It is made by skillful workmen, out of the best of material, and costs at least three times as much to manufacture it as it does the ordinary forceps, selling for $10.00. And we calculate that every part of the metal work is good for a hundred years' use, and the other parts, which are few proportionately. Each instrument is supplied with two cups in case of injury or accident to one. And it is probable that we sell it as low as ever we can afford to. Again, the physician who gets an instrument now, has the credit of its introduction in his own community. The physician who first uses a new and valuable remedy, and introduces it to his neighbor physicians, will, other things being equal, continue to hold the first rank in its use. Each instrument will be sent in a velvet-lined black walnut case.

Women who have seen a trial of this instrument,

have been uniformly pleased with its operation, and as much inclined to favor it, as they are to condemn the use of the ordinary forceps, and what practitioner is there that is not dependent upon their influence?

The instrument will be sent C. O. D. to any address. A fair discount to dealers. For the present, we make the following offer. Any physician paying us twenty dollars ($20.00) for an instrument, if not satisfied with its working, will have the privilege of returning it to us within twenty days, C. O. D., for exchange or receipt of the amount paid. We are aware that we are dealing with a learned and intelligent profession, and we wish to introduce it with perfect satisfaction in every case.

Should you not have an opportunity to use it in the lying-in chamber, a good test of its power in operation may be made as follows. Flex the knee to an acute angle, wet the edges of the cup well, and apply it over the integument of the tuberosity of the inner condile of the femer on the rounded prominence, exhaust the air and make traction. This will give you a good idea of its action upon the head, although the same amount of traction here can not be obtained.

All orders will be promptly attended to.

Address Pneumatic Forceps Co., or H. L. Stillman, M. D., Usquepaug, R. I.

Note.

Usquepaug, R. I., March 6, 1875.

To the Medical Profession :—

Allow me the honor to state that, from recent trials with my latest improved cup, I have succeeded admirably without the use of the dilators, and here give it as my opinion that a large majority of all cases coming under its use can be delivered without their assistsnce, and done much easier, and without exposure. From thirty to fifty pounds can, in nearly every case, thus be obtained ; much more than we had formerly supposed.

To prevent undue congestion of the scalp, we have inserted an additional valve, near the neck of the cup, so that, if necessary, suction may be used only when traction is being made. With a slight wound or abrasion of the scalp, undue hemorrhage may be thus prevented, although hemorrhage, if not extensive, is not dangerous as long as the umbilical cord is not divided.

These trials also were attended without injury to mother or child.

Signed,

H. L. Stillman, M. D.